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Ser 1813BD/00711
May 29, 1991

Ms. Eileen Hughes
California Department of Health Services
700 Heinz Avenue, Bldg. F
Berkeley, California 94710

Subj: RECOMMENDED REVISIONS TO THE SAMPLING AND ANALYSIS PLAN (Volume 1A) FOR PHASE 5 AND 6 OF THE RI/FS, NAS ALAMEDA

Dear Ms. Hughes:

This letter presents the proposed revisions to the Sampling and Analysis Plan for the Remedial Investigation/Feasibility Study currently underway at Naval Air Station (NAS) Alameda, Alameda, California. The recommended revisions herein pertain only to the location of soil samples within individual borings and the number of geotechnical samples. No changes to the types of chemical analyses are proposed

Original Sampling Plan.

The original sampling plan included the installation of 88 wells; to be installed at 40 cluster locations, 4 deep wells, and 4 individual wells to be used for aquifer testing. A total of three soil samples were to be collected from the vadose zone at each of the 40 cluster locations. One soil sample was to be collected at the ground surface and two were to be collected from the subsurface.

With the concurrence of the DHS, the number of monitoring wells recommended in the plan was reduced to forty-six (4 intermediate, 34 shallow, 4 deep, 4 aquifer (Table 1).

For example, the collection of samples from immediately above relatively fine-grained units within the uppermost water-bearing zone (above the Bay Mud Aquitard) will allow determination of whether dense constituents that may be present are migrating downward until halted by low permeability sediments. Samples collected from other zones with obvious indications of contamination will allow definition of potentially "worst case" conditions. Our specific recommendations are presented below:

One surface soil sample will be collected from each cluster location, as originally proposed. The recommended revised subsurface soil sampling plan will include the collection of one subsurface soil sample within the vadose zone at each well cluster location. The remaining subsurface soil sample(s) will be collected as follows:

- At cluster locations containing an "E" well a subsurface sample will be collected from immediately above the contact between the Bay Mud Sand unit and the underlying Bay Mud Aquitard. If thinner clays are identified within the Bay Mud Sand unit above the Bay Mud Aquitard contact, the sample from the interval exhibiting the highest PID reading or observed contamination will be submitted for laboratory analysis.

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- Chemical samples from "B" and "C" wells will be collected from within the screened interval of the well.

- Samples will also be retained from intervals exhibiting unusually high PID readings, stained intervals, or where waste materials are encountered. At locations where this situation is encountered, these samples may be submitted rather than those collected from within a screened interval, such as at "B" or "C" well.

Recommended Revised Sampling Plan - Geotechnical Samples

The proposed reduction in the number of geotechnical samples is shown in Table 1. Upon further review of data requirements for the SWAT and RI/FSt, the proposed reductions are judged to be sufficient to meet all RI/FS needs while eliminating a large quantity of unnecessary analyses. The proposed sampling plan is described below:

- **Cation Exchange Capacity (CEC.** CEC test are proposed as a substitute for Modified Proctor Compactor Tests. CEC results will be used in the evaluation of fate-transport modeling and thus, will be collected from within water-bearing zones. CEC evaluates the capacity of soils to sorb metal cations such as Pb, Cd, Cr, etc. Twenty-two samples will be collected; seventeen from within the uppermost water-bearing zone where the presence of contamination is most likely and five from within the Merritt Sand. This number of samples is sufficient to allow a statistical analysis of the results.

- **Permeability.** Permeability samples will be collected from units identified as aquitards. Permeability of aquifer units will be evaluated by slug tests, with some correlation with aquifer pump tests. Permeability of aquitards will be useful for evaluating vertical conductivity for remedial alternatives. Considering that the original soil boring data collected by Canonie indicates a relatively consistent aquitard unit (the Bay Mud Aquitard) across the site, one to two permeability tests per well cluster site should be sufficient to evaluate vertical permeability conditions. As such, 51 permeability tests are recommended for the 34 cluster sites.

- **Atterberg Limits**. Atterberg limits samples will be collected from within finegrained units. These analyses provide necessary information for soil classification and serve as a gross predictor of consolidation coefficients. This information will be used in evaluating settlement potential associated with capping as a remedial alternative. A total of thirty-eight samples will be collected from wells in the vicinity of the landfills.

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- **Moisture/Density and Specific Gravity**. Samples for moisture/density and specific gravity will be collected from within aquifer units to provide information on porosity and in-place density, and to aid in settlement calculations. One set of tests from every other well cluster will be sufficient for conducting the RI/FS. A total of seventeen samples will be collected from within the uppermost water-bearing zone and from within the Merritt Sand.

- **Gradation (with Hydrometer)**. Samples for sieve analyses will be collected from throughout the stratigraphic column. These analyses will be used to confirm field soil classifications and to provide data on the lateral and vertical variability of the individual units. A total of eighty-five samples will be collected from 17 cluster locations. One sample will be collected from each major stratigraphic unit identified at the cluster location.

- **Consolidation.** Samples for consolidation testing will be collected from representative non-granular units in the vicinity of the landfills. Consolidation test results will be used to evaluate settlement potential if capping is considered as a remedial alternative. Only a limited number of consolidation tests are necessary to determine the range of expected settlement. Twelve samples will be collected from around the West Beach Landfill.

- **Modified Proctor Compaction**. Compaction tests are useful when evaluating the suitability of soils for use as fill material or as a construction material. We do not believe this test will provide any meaningful data for either the RI or FS, including any evaluations of containment or disposal. We recommend that the test be deleted.

Thank you for your continued guidance in the IR program. Please direct any questions to Commander, Western Division, Naval Facilities Engineering Command (Attn: Ms. Bella G. Dizon, Code 1813BD, (415) 244-2552). Unless we receive verbal comments from you within a week, we will continue with the sampling plan as described herein.

Sincerely,

RICHARD SERAYDARIAN
Head, Installation Restoration Section

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Encl::
(1) Table 1 - Summary of Geotechnical Samples

Distribution:
Environmental Protection Agency, Region IX (Attn: Julie Anderson)
California Regional Water Quality Control Board (Attn: Lester Feldman)
Bay Area Air Quality Management District (Attn: Scott Lutz/Brian Jennison)
U.S. Fish & Wildlife Services (Attn: Don Palawski)
California Department of Fish and Game (Attn: Mike Rugg)
National Oceanic & Atmospheric Administration (Attn: Chip Demarest)
U.S. Army Corps of Engineers (Attn: Sharon Morlund)
Bay Conservation and Development Commission (Attn: Chris Perry/Richard Cooper)

Copy to:
PRC Environmental Management, Inc. (Attn: Kirk Switzer)
James Montgomery Engineers (Attn: Steve Newton)
NAS Alameda (Attn: Randy Cate)

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TABLE 1

SUMMARY OF GEOTECHNICAL SAMPLES

Analysis	Canonie Work Plan Number of Samples	Proposed Revised Number of Samples
Atterberg Limits	96	38
Gradation (with Hydrometer)	545	85
Moisture/Density	44	22
Specific Gravity	44	22
Permeability	289	51
Cation Exchange Capacity	0	22
One-Dimensional Consolidation	22	12
Modified Proctor Compaction	22	0